

A REVISION OF THE RACES OF DENDROICA AUDUBONI.

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Identification of Arizona specimens of *Dendroica auduboni* in the collection of the Biological Survey has made necessary this investigation into the geographical forms of the species. As these results are of some interest, it may be well to place them on permanent record.

Three subspecies of *Dendroica auduboni* have hitherto been recognized—*Dendroica auduboni auduboni*, *Dendroica auduboni nigrifrons*, and *Dendroica auduboni goldmani*—but to this number another should apparently now be added. The following conclusions are based chiefly on the considerable series (248 specimens) in the United States National Museum, including the Biological Survey collection, and comprising types of three of the forms here recognized. The type of the fourth, *Dendroica nigrifrons* Brewster, has also been examined.

Dendroica auduboni auduboni Townsend.

[*Sylvia*]. *Auduboni* Townsend, Journ. Acad. Nat. Sci. Phila., Ser. 1, VII, pt. ii, November 21, 1837, p. 191 ("forests of the Columbia River").

CHARS. SUBSP.—Size smallest, and with a minimum extent of black on the lower parts.

MEASUREMENTS.—Male:¹ wing, 71.5–77 (average, 74.9) mm.; tail, 55–60 (58.2); exposed culmen, 9.5–10.8 (10.3); tarsus, 18.5–20 (18.6); middle toe with claw, 10–12.8 (11.8).

Female:² wing, 69.8–73.8 (average, 71.6) mm.; tail, 55.5–58 (56.6); exposed culmen, 10–11 (10.3); tarsus, 19–19.8 (19.3); middle toe with claw, 10.5–12.5 (11.6).

TYPE LOCALITY. Columbia River, near Fort Vancouver, Washington.

GEOGRAPHIC DISTRIBUTION. Central British Columbia, through the western United States, to southwestern Mexico. Breeds north to central British Columbia; west to Vancouver Island in British Columbia, western Washington, western Oregon, and western California; south to southern California;

¹ Ten specimens, from Oregon, Washington, and British Columbia.

² Six specimens, from Washington and British Columbia.

and east to central eastern California, central Oregon, central Washington, and central British Columbia. Winters from southern British Columbia, south through California and Arizona, to the States of Guanajuato and Michoacan, Mexico. In migration it occurs casually east to Wyoming and New Mexico.

REMARKS. The type of Townsend's *Sylvia auduboni* was an adult male obtained by him on the Columbia River near Fort Vancouver, and is now in the United States National Museum. It proves to belong to the smallest race of the species, so that the specific name *auduboni* applies without doubt to the breeding bird of the Pacific coast region of the United States. This subspecies reaches its minimum size in Washington and British Columbia. Average wing measurements of adult males from different localities compare as follows: Washington and British Columbia, 74.9 mm.; California, 76.6 mm. Individuals from central Oregon and from California (excepting the southeastern portion of the state) are somewhat intermediate between typical *Dendroica auduboni auduboni* and the Rocky Mountain race, but are evidently nearer the present form.

The 116 specimens examined came from the following localities:

British Columbia.—Comox (May 31, 1895; June 1 and 8, 1895); Stuart Lake (June 4, 1889; eggs and nest); Wellington (May 25, 1895); Agassiz (Dec. 7, 1895).

Arizona.—Fort Verde (Jan. 23, 1888; Dec. 30, 1887); Apache (Oct. 26 and 29, 1874); Cochise (May 5, 1902); Tucson (Jan. 29, 1884).

California.—San Francisco (Oct. 29, 1895); San Bernardino (Jan. 5, 1886); Red Bluff (Dec. 22, 1883; May 6, 1884; April 7 and 25, 1884; March 29, 1884); Warner Mountains (Aug. 9, 1878); Poway (Feb. 24, 1888); Nevada (October, 1872); Berryessa, Santa Clara Co. (Jan. 20, 1889; April 4, 1890); Santa Clara County (Oct. 5, 1896); Lassen Peak (Aug. 26, 1898); Chico (Dec. 21, 1905; Jan. 5, 1906); Burney (June 9, 1906); South Yolla Bolly Mountain (July 29, 1905); Oro Grande (March 18, 1905); San Diego (Oct. 9, 1893); Riverside (Jan. 2, 1889); Carberry's Ranch (May 20, 1894); Strange Camp, 5800 feet, San Gabriel Mountains (July 16, 1905); Preston

Peak, northeastern slope of Siskiyou Mountains (Oct. 7, 1909); Cahto (May 6, 1889); Los Angeles County (Feb. 13, 1915); Camp Bidwell (July 24, 1878); Big Trees (July 7, 1878); Picard (Sept. 27, 1905); Mount Shasta (July 24, 1883; Aug. 10, 1898; Aug. 26, 27, and 31, 1883; Sept. 2, 1883); Sacramento Valley.

Nevada.—Arc Dome (May 22, 1898).

New Mexico. — Corner Monument No. 40, Mexican Boundary Line, 100 miles west of El Paso (May 3 and 5, 1892).

Oregon.—Beaverton (April 24, 1890); Portland (May 24 and 25, 1905); Lapush (June 12, 1897); Salem (March 25, 1888; Sept. 22, 1891); Fort Klamath (Sept. 5 and 6, 1882; Oct. 1, 9, and 13, 1882; July 16, 1882); Howard (June 10, 1915); Paulina Lake (Aug. 18, 1914); Home (June 27, 1916); 10 miles S. W. of Silver Lake (Sept. 2 and 4, 1914); Fremont (Aug. 23, 1914).

Washington.—Kirkland (May 11 and 18, 1911); Columbia River (April 24, 1836, type; April, 1836; May 31, 1835); Fort Steilacoom (about April 1, 1856; July 28, —); Steilacoom; Mt. St. Helens (Aug. 11, 1897).

Wyoming.—Fort Bridger (Aug. 27, 1858).

Chihuahua.—Chihuahua City (Oct. 21, 1893).

Guanajuato.—Guanajuato.

Jalisco.—Ocotlan (Dec. 24, 1902); Tonila (October, 1865).

Lower California.—La Laguna (Jan. 26, 1906); El Sauz, Sierra Laguna (Jan. 21, 1906); San Jorge (Nov. 25, 1859); Gardiner's Laguna, Salton River (April 20, 1894); Seven Wells (April 15, 1894); Mouth of Colorado River; La Paz (December, 1881); Mouth of Hardy River (April 2, 1905).

Michoacan.—Zamora (Jan. 20, 1903); Mt. Tancitaro (March 3, 1903).

San Luis Potosi.—San Luis Potosi (Feb. 3, 1891).

Sinaloa.—Sierra de Choix, 50 miles northeast of Choix (Oct. 19, 1898).

Sonora.—Sonoyta (Jan. 14, 1894); Guaymas; Taronato Creek, near U. S. and Mexican boundary line (Nov. 4, 1892).

Tepic.—Maria Cleofa Island, Tres Marias Islands (May 30, 1897); Tepic (December, 1865).

***Dendroica auduboni memorabilis*, subsp. nov.**

CHARS. SUBSP.—Similar to *Dendroica auduboni auduboni*, but larger; male with breast and jugulum nearly always more solidly and extensively black; and sides of head also with more of blackish.

DESCRIPTION.—Type, adult male; No. 137415, U. S. National Museum, Biological Survey Collection; Ward, Colorado, June 12, 1893; J. A. Loring. Upper parts between neutral gray and slate gray, the forehead and sides of crown thickly, the cervix sparingly, the interscapulum broadly, streaked with black; upper tail-coverts black, edged with the gray of the back; center of crown gamboge yellow; rump lemon chrome; tail brownish black, narrowly margined exteriorly with gray like that of the back or with whitish; wings rather light chaetura black, the tips of the quills dark fuscous, the secondaries edged and tipped with mouse gray, the primaries with pale gray or whitish; superior wing-coverts black, the median series broadly tipped, the greater series broadly tipped and margined externally with white, the lesser coverts margined and tipped with the gray of the back; sides of head and of neck gray like the back, the latter, together with the auriculars, flecked with black; a spot in front of the eye and of the suborbital region black; upper and lower eyelids white; throat and chin, gamboge yellow; jugulum and sides of breast, black, a little flecked laterally with the gray of the back; a spot on each side of the breast lemon chrome; remainder of lower parts white, the sides and flanks broadly streaked with black; lining of wing white, the under wing-coverts mottled with brownish black.

MEASUREMENTS.—Male:¹ wing, 77.3–83.5 (average, 80.5) mm.; tail, 60–66.8 (63); exposed culmen, 9.5–11 (10.3); tarsus, 18–21 (19.6); middle toe with claw, 10.3–13.2 (11.9).

Female:² wing, 72–78 (average, 74.5) mm.; tail, 55–61 (58.1); exposed culmen, 9.5–11 (10.1); tarsus, 18–20 (19.2); middle toe with claw, 11–12.2 (11.7).

TYPE LOCALITY.—Ward, Boulder County, Colorado.

GEOGRAPHIC DISTRIBUTION. — Central southern Canada, western United States, Mexico, and Guatemala. Breeds north to southwestern Saskatchewan and central Alberta; west to eastern Washington, eastern Oregon, central Nevada, and southeastern California; south to southeastern California, central Arizona, southeastern Arizona, and central western Texas; and east to central western Texas, central New Mexico, central Colorado, northwestern Nebraska, eastern Wyoming, western South Dakota, and central Montana. Winters north to southern California, southern New Mexico, and south

¹ Fifteen specimens, from Arizona, New Mexico, Colorado, and Montana.

² Twelve specimens, from Arizona, New Mexico, Colorado, and Wyoming.

central Texas; south to southern Mexico and Guatemala. In migration it occurs east to Iowa. Accidental in Pennsylvania and Massachusetts.

REMARKS.—The best character separating this new race from *Dendroica auduboni auduboni* is that of size, although this is less marked in the female. There is considerable individual variation in the amount of black on the lower parts, but this is nearly always of greater extent than in *Dendroica auduboni auduboni*. Birds from Arizona and Montana are of the same size, and of practically the same coloration. Individuals from Nevada and Idaho are intermediate between *Dendroica auduboni memorabilis* and *Dendroica auduboni auduboni*, though they are nearer the present form. The same remarks apply also to breeding birds from the mountains in southeastern California near the State border, as, for instance, Mount Whitney. All the breeding birds from the mountains of Arizona, except those from the Huachuca Mountains, belong to the present race, but those from the southern part of the State verge a little toward *Dendroica auduboni nigrifrons*. Comparative wing measurements of adult males from different localities are as follows: Arizona and New Mexico, 80.3 mm.; Wyoming and Montana, 79.2 mm.; Idaho, 78.6 mm.

The 104 specimens that we have examined represent the localities given below.

Arizona.—Graham Mountains (April 24 and 25, 1914; May 12, 1914); Fort Verde (May 5 and 22, 1884; May 3, 1887; March 6, 1886); Pinal County (March 19, 1885; Oct. 28, 1884); Nantan Plateau (May 15, 1916); Horseshoe Cienega, White River, White Mountains (July 9 and 15, 1915); Disaster Peak (June 14, 1915); Chiricahua Mountains (June 14, 1894); Camp 150, Coco Mengo Rancho (March 19, 1854); Apache (Oct. 26, 1874; Sept. 1, 1873); Mt. Graham, Graham Mountains (Sept. 21, 24, and 25, 1874; Oct. 29, 1874); San Pedro slope, Santa Catalina Mountains, Pinal County (May 6, 1885); Santa Catalina Mountains (June 10, 1906); Tucson (May 18, 1884; Nov. 18, 1890; April 13 and 19, 1884); Fort Whipple (May 5, 1865; May 8, 1866; Oct. 3, 1864; April 24, 1865; April 27, 1866); Yuma (March 10, 1894); Willow Spring (July 12 and 13, 1874); Monument No. 89, Mexican Boundary Line (Sept. 24, 1892); Sawmill, at 5,600 feet, 25 miles northeast of Rice (May 10,

1916); Tanks, 7 miles from Strawberry, Mogollon Mountains (July 3, 1886); Marsh Lake, White Mountains (July 20, 1915); Lakeside (July 5, 1915); Huachuca Mountains¹ (May 26, 1903; April 8, 24, and 27, 1903; Sept. 10 and 21, 1893).

California.—San Denias Canyon, Los Angeles Co. (Oct. 24, 1915); Riverside (April 16, 1887); Berryessa (Dec. 5, 1889); Cahto (May 15, 1889); Mount Shasta (Aug. 31, 1883); Oro Grande (March 22, 1905); Mendota (Oct. 2, 1907); Placerita Canyon, Los Angeles Co. (Dec. 10, 1915); Mt. Whitney (June 19, 1891; July 7, 1891); Santa Barbara (October, 1888); Laguna Station, San Diego Co. (May 5, 1874); Death Valley (Feb. 1, 1891); Fullerton (Dec. 4, 1900); Southern sierra Nevada (July 26, 1891).

Colorado.—Denver (May 7, 9, 10, and 17, 1873); Pueblo (Oct. 14, 1874); Estes Park (July 17, 1893).

Idaho.—Swan Lake (July 5 and 7, 1911); Lardo (July 18, 1913); Edna (June 21, 1910); Tamarack (July 6, 1913); Inkom (June 25, 1911); Idaho City (June 16, 1910).

Montana.—Chief Mountain Lake (Aug. 22, 1874); Jefferson River (Sept. 15, 1888); Sioux National Forest, 8 miles east of Sykes (June 2, 1916); Madison River (Sept. 23, 1888); 5 miles southeast of Ekalaka (May 28, 1916); 5 miles south of Ekalaka (May 28, 1916).

Nevada.—Lake Tahoe (Sept. 18, 1876); Toyabe Mountains (Aug. 16, 1915); Arc Dome, Toyabe Mountains (May 24, 1898); Carson City (April 4 and 18, 1868).

New Mexico.—Pecos (July 20, 1883); Tres Piedras (July 31, 1904); Aug. 1, 1904); Rinconada (May 3 and 31, 1904); Fort Cummings (Oct. 15 and 25, 1873); Gila River (Oct. 11, 1873); Corner Monument, No. 40, Mexican Boundary Line, 100 miles west of El Paso (May 3 and 5, 1892); Zuni Mountains (June 16, 1909); Camp Grant, 6 miles east of Tucson (March 10, 1867); Dog Spring, Grant Co. (May 24, 1892); Elizabethtown (Sept. 17, 1903); southwestern slope of Capitan Mountains (July 10 and 13, 1903); Big Hatchet Mountains, Grant Co. (May 18, 1892).

Oregon.—Strawberry Mountains (July 13, 1915).

South Dakota.—Hot Springs (Oct. 17, 1892); Redfern (June 2, 1910).

¹ Not breeding.

Texas.—Fort Clark (April 6, 1893); Eagle Pass (Oct. 27, 1890); Henrietta (April 19, 1894); Fort Stockton (April 20, 1860); Marathon (May 15, 1901).

Utah.—Mouth of Bear River (May 23, 1915; Sept. 10, 1914).

Wyoming.—Teton Pass (Sept. 15, 1910); Laramie; Horse Creek, 8,000 feet, near Merna (Aug. 12, 1911); Casper Mountains (Aug. 28, 1909); Jackson (May 17, 1911); 14 miles south-east of Laramie (July 15, 1915); Fort Steele (May 22, 1911); Fremont Peak (July 18, 1911); Sierra Madre Mountains (June 16, 1911); Fort Bridger (May 20, 1858); western side of Wind River Mountains (June 6, 1860); Bridgers Pass (May 9, 1890); Laramie Peak (May 16, 1864); Pahaska (July 30, 1910); Medicine Bow Mountains (June 30, 1911); Fossil (May 7, 1912).

Chiapas.—[No further locality] (Jan. 24, 1869).

Chihuahua.—Colonia Pacheco (May 22, 24, and 31, 1909).

Coahuila.—Saltillo (April 17, 1902).

Guanajuato.—Guanajuato.

Hidalgo.—Real del Monte (May 5, 1891).

Lower California.—Comondu (Nov. 9, 1905); Ensenada (Feb. 27, 1906); Cape San Lucas (Nov. 12, 1859).

Mexico.—Salazar (Oct. 26, 1892); Tlalpam (Dec. 8, 1892).

Michoacan.—Patamban (Jan. 29, 1903); Mt. Tancitaro (March 4, 1903); Los Reyes (Feb. 8, 1903).

Nuevo Leon.—Monterey (Feb. 21 and 26, 1891).

Puebla.—Chalchicomula (April 13, 1893).

Sinaloa.—Mazatlan (December, 1867).

Sonora.—Mouth of Colorado River.

Yucatan.—Temax (1884).

Guatemala.—[No more definite locality].

***Dendroica auduboni nigrifrons* Brewster.**

Dendroica nigrifrons Brewster, Descriptions of Supposed New Birds from Western North America and Mexico, Jan. 31, 1889. [The Auk, VI, No. 2, April, 1889], p. 94 ("Pinos Altos, Chihuahua, Mexico").

CHARS. SUBSP.—Similar to *Dendroica auduboni memorabilis*, but male with upper parts and sides of neck darker, the back with much more black, the forehead and sides of head entirely of this color; breast, jugulum, flanks, and sides of body solidly black; female darker than the

same sex of *Dendroica auduboni memorabilis*, with more black both above and below.

MEASUREMENTS.—Male:¹ wing, 78–85.5 (average, 81.8) mm.; tail, 58–68 (62.8); exposed culmen, 10–10.5 (10.2); tarsus, 18.5–20 (19.4); middle toe with claw, 11.3–12.8 (12).

Female:² wing, 75–77.5 (average, 76.1) mm.; tail, 57–61 (58.5); exposed culmen, 9.5–10.8 (10.3); tarsus, 18.5–20 (19.3); middle toe with claw, 11.7–12.8 (12.2).

TYPE LOCALITY.—Pinos Altos, Chihuahua, Mexico.

GEOGRAPHIC DISTRIBUTION.—Southern Arizona and north-western Mexico. Breeds north to the Huachuca Mountains in central southern Arizona, and southeast through western Chihuahua to southern Durango.

REMARKS.—This race of the Audubon warbler occurs in the United States only in the Huachuca Mountains, Arizona. Birds of this species from all the other adjacent ranges are, as already explained, referable to *Dendroica auduboni memorabilis*. Those from the Huachuca Mountains are, furthermore, in color somewhat intermediate between *Dendroica auduboni nigrifrons* and *Dendroica auduboni memorabilis*, as would be expected from their geographic location, but are decidedly nearer the former. Comparative average wing measurements of males are as follows: Chihuahua, 81.3; Huachuca Mountains, Arizona, 82.3.

Of this subspecies 29 specimens have been available, from the subjoined localities.

Arizona.—Huachuca Mountains (Aug. 19, 26, and 30, 1902); July 1 and 13, 1902; July 31, 1893; May 11, 20, and 26, 1903; June 21, 1902; April 5, 1903; May 9, 1902).

Chihuahua.—Colonia Pacheco (June 3 and 9, 1909); Colonia Garcia (July 4, 1888; July 3, 9, and 24, 1899; Aug. 5, 1899); Pinos Altos (June 5, 1888, type).

Durango.—Cerro Prieto (Sept. 10, 1898); El Salto (July 11, 1898).

***Dendroica auduboni goldmani* Nelson.**

Dendroica goldmani Nelson, The Auk, XIV, No. 1, January, 1897, p. 66 ("Hacienda Chancol, Guatemala").

¹ Nine specimens, from the State of Chihuahua, Mexico, and from Arizona.

² Eight specimens, from the States of Chihuahua and Durango, Mexico, and from Arizona.

CHARS. SUBSP.—Similar to *Dendroica auduboni nigrifrons*, but with still more black on the upper parts, the whole top and sides of head being solidly black (excepting, of course, the yellow crown space and the white cervical spot); flanks not solidly black; and black of posterior lower parts not so extensive; a large white spot on each side of the posterior border of the yellow throat; and white occipital patch much larger.

MEASUREMENTS.—Male: (type) wing, 83 mm.; tail, 66.2; exposed culmen, 10.6; tarsus, 20.7; middle toe with claw, 13.

TYPE LOCALITY.—Hacienda Chancol, at about 10,000 feet altitude, Huehuetenango, western Guatemala.

GEOGRAPHIC DISTRIBUTION.—Mountains of western Guatemala.

REMARKS.—The only specimen of this subspecies that, so far as we are aware, has been obtained is the type. Nevertheless in this the characters are such as indicate its subspecific distinctness from *Dendroica auduboni nigrifrons*, since the differences that characterize the latter as distinguished from *Dendroica auduboni memorabilis* are in *Dendroica auduboni goldmani* carried still further.